

Seedlings of Cactaceae.—Among the Cactaceae certain members, including the genus *Pereskia*, have a seedling with two fairly thin cotyledons and a slender hypocotyl; while others, as *Mamillaria*, have minute cotyledons and a globular hypocotyl. Miss DEFRAINE³⁶ finds that the mode of transition from stem structure to root structure in these two groups is different; in other words, the adaptations to environment shown by the adult plants has spread to the seedlings, and has also had an effect on the internal structure. Since some species show a pair of bundles in the hypocotyl, a comparison is instituted with the liliaceous genus *Anemarrhena*, in which the same condition appears. The presence of the double bundle in the cotyledon of this genus has been used by Miss SARGANT as the basis of her argument for the derivation of monocotyledons from dicotyledons by fusion of the two cotyledons, but Miss DEFRAINE finds the origin of the double strand in the Cactaceae so various that she considers the validity of the argument to be seriously weakened. A number of interesting points of detail are recorded in the paper, supplementing the work of GANONG³⁷ on the cactus family.—M. A. CHRYSLER.

Foliar gaps of Osmundaceae.—JEFFREY'S Pteropsida are characterized by the presence of leaf gaps, but it has been urged by some recent investigators (notably KIDSTON and GWYNNE-VAUGHAN) that they are absent frequently in the Osmundaceae. SINNOTT³⁸ has undertaken to investigate this group, and concludes that leaf gaps are always present. In the six living species studied a number of cases of mature stems were observed in which the gap did not become complete for some time after the departure of the leaf trace, "which thus at first seemed to go off in a gapless manner." All of the known fossil Osmundaceae with true parenchymatous pith show leaf gaps, with one exception, and this is explained as "a form with very short and narrow gaps, which have been largely obliterated in the process of fossilization." In all the young plants investigated, leaf gaps were evident from the earliest stages. Putting together the testimony from fossil and living forms, and also the juvenile and mature stages of the latter, the conclusion is reached that the presence of leaf gaps is a primitive feature of the Osmundaceae, and that they are placed properly among the Pteropsida.—J. M. C.

Embryo of *Pinus Pinaster*.—SAXTON³⁹ has studied the development of the embryo of this species as it grows in Cape Colony. The general results are as

³⁶ DEFRAINE, E., The seedling structure of certain Cactaceae. *Annals of Botany* 24:125-175. 1910.

³⁷ GANONG, W. F., Contributions to a knowledge of the morphology and ecology of the Cactaceae. *Annals of Botany* 12:423-472. *pl.* 26. 1898.

³⁸ SINNOTT, EDMUND W., Foliar gaps in the Osmundaceae. *Annals of Botany* 24:107-118. *pls.* 11, 12. 1910.

³⁹ SAXTON, W. T., The development of the embryo in *Pinus Pinaster* Soland., with some notes on the life history of the species in Cape Colony. *S. African Jour. Sci.* 6:52-59. *pl.* 2. 1909.